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JULIUS F. SACHSE, Editor. XANTHUS SMITH, Associate Editor.

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EXPIRATION OF THE PATENT ON THE WILLIS PLATINUM PROCESS.

We have lately received a number of communications relative to the status of the patent on Willis' Platinum Process, which heretofore has been a monopoly, placing the photographer completely at the mercy of the controllers of the patent, a license being required which was only issued under certain restrictions. Conditions which tended to prevent the general introduction of the process in this country. In connection with this subject we have received the letter, reproduced in fac-simile, on the next page. This opinion was written by Hector T. Fenton, Esq., the eminent patent lawyer, in response to an inquiry from Mr. Emil Schneider, a well-known manufacturing chemist of Newark, N. J.

Should this information prove correct it will be welcome news to many photographers throughout the country, professional and amateur, who are partial to the peculiar effects produced by the platinum process, as they are now at liberty to produce the prints without having to procure a license from the patentees, and be hampered by its restrictions. According to this opinion they can now go into the open market for their paper and chemicals, which will without doubt greatly increase the demand, and induce other chemists to prepare the requisite salts of equal purity at greatly reduced prices.

Telephone No. 82

Law Offices
Hector T. Fenton
No. 903 Walnut Street

Patent Causes

Philadelphia June 16, 1891.

Mr. Emil Schneider,
Newark, N.J.

Dear Sir:-

I have examined the printed form of contract of license used by Willis and Clements and have obtained a copy of the U.S. patent referred to therein and on which it is founded. I find on examination of the records of English patents that Willis took an English patent for this invention No. 2011, dated December 2, 1873. Under the United States statutes in force at the time his American patent was granted, the latter is limited in term to expire with the prior English patent. The consequence of this is that his American patent has now expired and any licenses granted under it terminate with it. The licensees are therefore now at liberty to buy their chemicals used in the process wherever they please.

Yours truly,

H. H. Fenton

ORIGINALITY IN POSING AND LIGHTING.

BY XANTHUS SMITH.

MY attention has been called to "Originality in Posing and Lighting" as a subject appropriate for some remarks, by me, and while at first sight if would appear to offer an opportunity for the production of a paper embodying some new and good ideas, a further consideration of the theme brings one to the question at the outset, whether there truly can be such a thing as originality displayed now in posing sitters and lighting them? We certainly must admit that if any one could point out an entirely new path for the portrait photographer, one which would lead him to show cases filled with fascinating pictures of such handsome looking people that every passer-by would not only be attracted by them, but would be seized with an inevitable desire to be portrayed in the same style, a great benefit would be conferred upon not only the photographer but the public generally.

Unfortunately for the explorer in new directions of portraiture there are some barriers as insurmountable as the great ice wall of the Antarctic regions. We have to deal with things as we find them. Could we re-construct our sitters, and remould them in conformity to individual freaks of taste and fashion then indeed would there be new and startling ways open to us for posing and lighting. If on placing a sitter in the posing chair, in addition to twisting and tilting his head about, we could re-shape his features in the same manner that a lump of putty may be dealt with—then only might we set at naught those critics who scoff at the old conventional three-quarter face with a top and side light, somewhat in front. But this we cannot do. The head is globe-shaped, the nose, except perhaps occasionally in the case of pugulists, is always the most prominent feature, and as the laws of light and shadow are inexorable we must abide by them.

Undoubtedly novelty is always attractive. It is attractive by virtue of its newness. But it is not always agreeably attrac-

tive—as we see in the matter of novelty in dress, what strikes one as elegant and appropriate appears entirely the reverse, indeed often quite absurd to another—and where there are certain principles and rules of good taste governing a matter as is particularly the case in the making of portraits, by reaching after new and startling effects, while we may attract a few untutored or unthinking people—on the other hand we may be lowering ourselves in the estimation of the more sensible majority.

The matter of posing and lighting sitters occupies an entirely different place to-day from that which it did ten years ago. During the last decade, owing to the large incoming of amateurs, the amount of experimental and accidental work which has been done may be said scarcely to have left a single untried pose or effect of which photography is capable.

Prior to the adoption of the dry plate there were very few amateur photographers, and by far the majority of those who practiced the art, devoted themselves to landscape and architectural subjects. The professional photographer of course always worked in a skylight constructed in accordance with certain established rules, thought best for lighting sitters, and, therefore, pictures of people, taken off-hand, under every day surroundings and conditions were very rare. Now it may fairly be said that everybody photographs, from the schoolboy to the man gray in years, and the fair sex, young and old, the latter furnishing us some of our finest productions of the art—and a large portion of the work done by these numerous and busy amateurs being portrait work, do we not have an opportunity of beholding the utmost originality displayed in posing and lighting, including both studied and unstudied effects? and how often, after all, do we see amongst this multiplicity of work any that will compare in success with that of the professional photographer possessed of knowledge and good taste—open as his work may be to the criticism of conventionality—and why? simply because as I said at the outset, there are certain laws of nature and certain rules of good taste governing the whole subject which cannot be set aside without offending.

Simply touching upon the matter of a certain propriety and grace in attitude, which the rules of society call for, and which we dare not stray from without becoming vulgar or ridiculous, in lighting alone, of all heads which we see posed by untutored amateurs in ordinarily lighted rooms, under porches and amongst shrubbery, what do they amount to? How many in the hundred fill the place to those who wish to have their picture taken, and be done justice to, of the regularly posed head in a proper sky-light. All that we can say of the most of such work, is that it is beneath criticism as portraiture.

Turning then to the work done by the best professional photographers, we find them constantly striving for novelty, partly through a desire to produce something which is more excellent in an artistic way than what has yet been done, and partly to attract sitters and thereby increase the business and the income, and we find that just in proportion as they deviate from certain limits, and run into the new and the startling, just in so much do they run the risk of producing effects which pall upon the taste of the observer when the brief pleasurable sensation of the first impression has worn off.

Take, for instance, a handsome lady, place her in a natural easy attitude with the "old conventional top and side light somewhat in front" and having secured a calm expression, so photograph her, and then photograph her again, posed elaborately, with her head twisted in an opposite direction from her shoulders, and thrown very much up, and the face wearing a bewitching smile, and lighted in any way you please, except that adopted in the previous portrait, and of the two pictures see which will be likely to give the most lasting satisfaction, will be the best suited to go down to posterity as a likeness of the lady. Of course the more we include in our portrait subjects the more we enlarge our scope for originality in composition. When we make whole lengths, and groups, with accessories, we can give scope to what fancy may dictate to us. But our difficulties then increase many fold. The present attire of the male, though comfortable, can neither be said to be very dignified or graceful and just in proportion as we admire the latest attractions in dress of our female friends at the moment

of their production so do they seem out of place or absurd to us when they have been set aside some months subsequently to give place to others.

To be convinced of the unpleasing effect of peculiarities in costume we have only to look at any collection of full length photographs extending some years back. The more elaborately the individuals were gotten up for the occasion, and the more imposing the effect striven after, the less do we see in the picture to seriously interest us. We find ourselves at once critics of costume and furniture instead of admirers of humanity.

Let those who have the opportunity of doing so, and are sufficiently interested in the subject, go and examine the fine display of work in the show windows of leading photographers, where the proprietors deal with the best trained of society, including those prominent on the stage, furnishing the best means for a display of originality in costuming, posing and lighting, and see how narrow the line of propriety is, and how in striving after a new pose or effect, for one successful hit, we are only too apt to have to point to a dozen failures.

In conclusion we must say that we give up the problem of pointing out any strikingly original scheme in the art of posing and lighting sitters for their portraits, and can only suggest that in securing softness and breadth of light and shadow, ease and general simplicity, we are always working in a safe direction.

Photographing Flying Insects.—It was a wonderful achievement to photograph flying birds. But M. Marey now makes a much longer stride than this in the art of photo-chronography. He has invented an apparatus which he has been describing to the Paris Academy of Sciences, whereby he is able to obtain photographs of flying insects. It allows exposures to be made so short as a twenty-five thousandth part of a second, and reveals the fact that the wings of a flying insect act like sculls of a rowing boat.—*Exchange.*

CARBON DYES.

PROFESSOR WILLIAM H. SEAMAN.

THE scientific conception of color is a wave of a certain definite length in the cosmic ether. The name is also given to any substance that has the property of reflecting or transmitting particular waves, and can be applied in any way to a surface to which it gives its own color.

Substances of the latter class are of two kinds, those which must be stuck on or fastened by some adhesive cement to the surface to which they are applied, and those which soak into and saturate the material. The first are usually insoluble powders, known as pigments, and the latter are soluble in a medium such as water, alcohol, or benzine, and are called dyes. The latter also combine chemically more or less with the substances to which they are applied.

Previous to 1856 the latter were mostly of vegetable origin, as logwood, fustic, quercitron, etc. In that year Perkins' violet was put on the market, the first dye commercially successful that was made from anilin, the latter substance being obtained indirectly from coal tar, which has also furnished the raw material for many other colors, often called generically, coal tar colors.

These substances have proved superior in every respect as dyes to any others known, and hence will in a short time be the only dyes in use. The popular idea, that they are fugitive, is based on some of the first, and is not true. They differ among themselves, just as do the older dyes, in this respect, but many are the fastest colors known. Excepting carbon black, every color is modified by long exposure to light, moisture, and warmth[1].

It is impossible to give any correct ideas about carbon dyes without some reference to their chemical relations, because they are especially the children of modern chemistry. Like organic substances, they consist mostly of charcoal or carbon,

1 De Abney. Sci. Am. Supplement, No. 689–690. Light and color. Report British Ass'n 1888. A. Richardson. Permanence of colors.

C; oxygen, O; hydrogen, H; and nitrogen, N, with in some cases small quantities of sulphur, chlorine, or either element. The variety of elements in their composition being so small, their properties are due to variation in the number and peculiar grouping of the atoms around a central nucleus of carbon.

According to Giercke[2], Waldeyer was the first to employ these dyes in microscopy, but he says they have not yet found favor.

This statement is no longer true, they are essential in bacteriological work, and also in double staining, in which they achieved their first success.

Slight changes in the methods of manufacture often make differences of shade which are denoted by letters as BB, BBB, or 4B, the latter indicating a deeper shade, or as scarlet G, (gelb) orange.

Most of our supply comes from Germany, but several kinds are now made in this country. Nearly every dye is protected by patents and made by a single firm.

The chemical name of these substances expresses their composition according to chemical rules, but as the name increases in length with complexity of composition, those much in use often acquire trade names, that vary with the fancy of the maker. Thus Bismark brown, vesuvin, anilin brown, leather brown, Manchester brown, etc., are trade names of the dye known to chemists as Triamido-azo-benzine chloride, C_{12} H_{15} N_5 Cl_2. Chrysoidin is Diamido-azo-benzine chloride, C_{12} H_{13} N Cl.

From a practical standpoint, they are divided in two classes, those which dye without mordants, or substantive colors, and those which require some fixing agent, as chrome alum or acetic acid, known as adjective colors. The substantive colors are best adapted for the microscopist.

The earlier colors had much more affinity for animal matter than for vegetable, and hence were not well adapted for plant work. The number of substantive dyes has lately been much increased by additions to the class of azo dyes, adapted to unite

2 Giercke, 262 methods of staining. Am. Monthly Micros. Journ. 1885–1886.

with cellulose without any mordant, and extremely fast to light, etc.

Among these especially to be recommended for the microscopist are the Benzidin colors as Congo red, of which there are several kinds made by combining with Benzidin, $C_{12}H_8(NH_2)_2$, various sulphonated phenol derivatives.

Many of these dye directly, otherwise with a little alkali, giving some shade of red, which changes to blue by the addition of a weak acid.

Eosine may almost be regarded as the name of a class of dyes, so many varieties are called by this title, alone or in combination. They are derived from fluorescein, $C_2\ O\ H_{12}\ O_5$, which is one of the most intense coloring substances known, though not fast. It is said that one part in 2,000,000 in water may be readily observed. This enables it to be used to detect leaks in pipes, etc.

Its derivatives made with haloids and alcohol radicals, are much used in microscopical work. As with other popular dyes, it is impossible to specify the characters of any particular specimen, unless the maker's name and exact trade name are known. Perkins' violet, Mauvein, Rosein, Anilin violet, Mauve, Purpurin, Phenamine, Tyraline are a few of the names of the first of the carbon colors that came into commerce, obtained by the oxidation of commercial anilin. It is not so much used as formerly, but in the main ingredient of the inks used for rubber stamps.

Alizarin chemically is different from the preceeding, being derived from anthracene, and forms the base of a great variety of colors, according to the mordant used, from yellow through red to black. Anilin blue, soluble blue, Nicholson's blue, and methyl blue are compounds of tri-phenyl rosanilin, and in some cases admit of direct dyeing.

It is impossible to classify these substances so that the general reader will obtain any information therefrom. The chemist looks upon them as derived from anilin and its homologues, phenol or carbolic acid, alizarin, etc., while the dyer considers them as different kinds of a color, as alizarin blue, crocein scarlet, etc. But the same article may be produced by different

processes of manufacture, and the same color by dyes entirely different in other characters, as fastness to light, soap, etc.

As every one is produced by some peculiar chemical process, first described in some journal, or in a patent, it has become customary in technical literature, to identify them by the number of the patent, or the book where first described, and this is the most certain and shortest way of doing it.

It is thus impossible to do justice to the subject in a magazine article, and those who desire further information, will find it in the following works, of which the first two will be found most generally useful:

The chemistry of coal tar colors, Benedikt and Knecht; London; George Bell and Sons, 1886. Organic Analysis, by Alfred B. Prescott. New York; D. Van Nostrand, 1887. Commercial Organic Analysis, by Alfred H. Allen. Vol. III. J. and A. Churchill, London, Eng., 1889. Tabellarische Uebersicht der kunstlichen organischen Farbstoffe, Schultz and Julius; R. Gaertner, Berlin, 1888. Fortschritte der Theerfarbenfabrication und verwandter Industriezweige, 1877-1887, Dr. P. Friedlander; Julius Springer, Berlin, 1888. Handbuch der organischen Chemie, Dr. F. Beilstein; Leopold Voss, Hamburg and Leipzig, Zweite Ausgabe, 1887.—*The Microscope.*

PHOTOGRAPHY IN THE TROPICS.

PROF. S. W. BURNHAM.

A FEW suggestions may not be out of place bearing upon the practical side of making photographic negatives in the damp and hot regions of the West Indies and the northern part of South America. The same conditions seem to prevail for at least twenty or thirty degrees of latitude. Heat and dampness have been considered to be conditions most dangerous to the keeping of dry plates, and manufacturers frequently caution purchasers to keep the plates in a dry and cool place. One who has not visited such a place cannot understand the excessive dampness which pervades everything, and the extreme discomfort produced by temperature even lower than 90°. Clothes and shoes mould over night in the sleeping-room, and nothing ever seems to get dry, except the new comer, whose thirst is perpetual. If these conditions had been fully considered before leaving home, the boxes of plates would have been packed in such a way as to exclude them from the outside air; but this was not done, and until the plates had

been repeatedly tested, it was feared that they might have received some injury. As soon as possible after arriving at Cayenne a dark room was made for developing, and a large number of plates, which had been exposed about Cayenne, and before reaching there, were developed. There was no evidence of any kind that the plates had suffered any deterioration. The negatives made and developed at this time, though substantially all instantaneous exposures, were both creditable to the excellence of the SEED plates and gratifying to the photographer. Several boxes of unexposed plates were brought back, and these, when used, appeared to be in their original condition. Some 8x10 plates exposed in Trinidad, on the return trip were placed in a box containing two unexposed plates. When we journeyed to Mt. Hamilton, the two unexposed plates had been forgotten, and one of them was placed in the developer. No image appearing, the tray was placed on the rocker and the development was kept up for at least an hour, and perhaps for an hour and a-half. Then the true state of the case was suspected, and the plate was rinsed and put away to dry. Some days later it was put in the camera and exposed, and as fine a negative made of the large telescope as any one would wish to have. This certainly could not have happened with either a poor plate or a damaged one.

With the chemicals the change was apparent. The sulphite of soda, though taken in the original bottles as sealed by the manufacturer, had absorbed so much moisture that that which was originally a fine powder had become a solid mass, which could not be dug out of the bottle with a sharp steel implement, and could only be broken up by first breaking the bottle. The carbonate of soda fared much the same way, notwithstanding the packages were in their original sealed condition; and the hyposulphite of soda continued to absorb so much moisture that there was always in the vessel in which it was kept several ounces of a saturated solution. Of course in such a state the usual quantities of carbonate and sulphite of soda, weighed for making up developer, became quite uncertain from the addition of an unknown quantity of water; and the best way of developing with the chemicals in this condi-

tion was thoroughly learned by making a great many exposures in and around Cayenne, and experimenting in the development until the best proportions were found. In going to a climate like this, all chemicals which have a tendency to absorb moisture should be carefully sealed with wax, or in some other way made air tight, and particularly hyposulphite of soda, which should be hermetically sealed in a substantial package; otherwise this chemical will become saturated, and the excess of water will escape, if possible, and perhaps damage other things. Of course plates, and chemicals which might injure them, should never be packed in the same box. It is always better to take the necessary developing materials and develop the plates as soon after exposure as possible. Many things will spoil an undeveloped plate which would not injure a negative. This is with reference to the ordinary landscape views.

For special exposure and photographic work of particular value, it goes without saying that the plates should in all cases be developed on the spot. There is nothing to lose by this course, and everything to gain. To say the least, it is dangerous not to do it; and no one would pretend to say, after developing a flat and weak negative, which had been transported a long distance after exposure, that the result would not have been entirely satisfactory if carefully developed at the first.

An Accelerator.—According to Dr. Eder, in the *Photographische Correspondenz*, a tincture of iodine consisting of 1 gramme of iodine in 50 c. c. of alcohol, and diluted with 50 c. c. of water, produces an extraordinary effect when added to the hydroquinone developer. Three to six drops in 40 c. c. of developer causes the image to appear almost instantaneously. The contrasts appeared much softened, and a weak image often results when the exposure has been instantaneous.—*Scraps.*

AUXILIARY LIGHTING.

AT a recent meeting of the Photographic Society of Philadelphia, an old and, at the same time somewhat vexed question was revived by Mr. J. F. Sachse reading a paper on The Preliminary, Secondary, and Supplemental Lighting of the Photographic Plates. We say it is an old and vexed question, inasmuch as it was introduced in the early days of the Daguerreotype, when its utility was upheld by some, while it was decried by others. At that period, when a plate was found to be under-exposed, it was no uncommon thing to give it a slight blush of weak daylight to obtain more detail. With the view of shortening the exposure, some one of that period proposed to whiten the inside of the camera. Of course, the reflection from the white sides produced diffused light in the camera, and this would be equivalent to a supplementary exposure.

On several occasions during the reign of wet collodion this question came to the front, and several warm discussions arose as to whether there was any actual gain in the employment of supplementary lighting. Many averred that there was, if made through different colored media, some considering blue the best, and others green, red or yellow; while, on the other hand, many declared that the supposed gain was merely a slight fogging of the plate, so that the shadows, which would otherwise be clear glass, became slightly veiled, by which a more harmonious result was obtained, though it was denied that more detail was brought out.

In our volume for 1872 will be found details of a series of experiments conducted in our presence by Mr. E. W. Foxlee, with, of course, wet collodion. In these experiments the plates were exposed through different colored media, both before and after the primary exposure in the camera. The results proved that there was a considerable gain in detail by the treatment, and without the slightest trace of fogging, unless the supplementary lighting was carried too far. Also, that it made no difference what colored medium was employed provided an

equivalent exposure was given, nor whether the secondary exposure was made, before or after the primary one. Also that subdued light was just as good as any other. In fact, it was proved that it was the action of light that did the work, and the only advantage of the colored medium was that the auxiliary exposure was more under control than when white light was used, owing to its greater activity.

Some, in repeating the experiments, found no advantage in the supplementary lighting as, even when most sparingly used, decided fog was produced, and that too without any additional detail being obtained. Whence, then, the discrepancy? It was this. Many of those who decried supplementary lighting most were actually, though unwittingly, taking the fullest advantage of it.

Those who remember what many dark room windows were in the collodion days know quite well that often a considerable amount of actinic light reached the plate both in the sensitising and in the development. Now, it will readily be seen that, if during the manipulation of the plate it received the maxium light and would bear it without fogging, any supplementary lighting would certainly cause a veiling. We well remember, about the time referred to, a portraitist told us that he had just fitted up a new dark room, and, to his astonishment, he found that negatives developed in the new room necessitated fully one-third longer exposure than those developed in the old one. He at once suggested, by way of experiment, that an additional thickness of orange fabric should be put over the old window. This was done, with the result that a much longer camera exposure was entailed.

With gelatine plates it would, at first sight, appear that supplementary exposure would be of little value, as those plates ought to be sensitive enough for all purposes. Yet we venture to say that, at the present time, there is a larger proportion of under-exposed negatives made, particularly by amateurs than was ever the case before. This is due to the fact that the majority of the negatives taken are "snap shots."

Now, if these under-exposed pictures can be helped up by supplementary lighting, a great benefit would accrue. The

general consensus of opinion at the Philadelphia meeting was that there is a very considerable advantage in supplementary exposure if made through colored glass, though the experiments made many years ago with wet collodion, proved that colored light possessed no advantage over white, beyond that, with the longer exposure necessary with the former, there was less chance of error in timing.

We know some workers who, when they find a plate somewhat under-exposed, submit it for a second or two to a bare candle or gas light, and thus obtain more detail.

At the meeting referred to, it was suggested that some were unconsciously availing themselves of supplementary lighting through actinic light emitted from the lantern.

Those who may be tempted to test the value of auxiliary lighting should, in their initial experiments, make sure that they are not already using it to its fullest extent. If they are, then anything in addition will certainly produce fog. Many lamps and dark-room windows pass as much actinic light as most plates will stand without fogging. The same remark applies to cameras, which, from the thinness of the bellows or the reflection from their sides often permit a faint diffused light to reach the plate, though not in sufficient quantity to really produce even a trace of fog, yet it may be enough to act as an auxiliary exposure.—*The British Journal of Photography.*

THE *Philadelphia Ledger* of September 17th, in a paper describing the glories of the Yellow Stone Park, states: That well-known Philadelphia photographic artist and inventor, Ives, is now testing his last invention, photographing in colors, on its walls of yellow and red, brown and gray, white and green, and his results will be exhibited next winter at the Franklin Institute and at the Photographic Society, when all who have seen its wonders can test the success of his work, while to those who have never seen it his pictures will reveal its beauties in a better way than can be hoped for by any other method.

THE PHOTOGRAPHIC REPRODUCTION OF OLD MSS.

OF late years the photographic reproduction of important manuscript documents, has become an important branch of our art. As these in many cases are illegible and sometimes entirely faded through dampness or by the use of unstable inks, the photographer is often at a loss how to proceed so as to make a satisfactory reproduction. To overcome this difficulty a German contemporary suggests to slightly dampen the faded manuscript, then paint the writing over with sulphide of hydrogen and ammonia, (schwefelworserstoff-ammoniak), when the writing will immediately come out black and legible. If the document is parchment, the restoration is permanent, if paper the result is similar but the effect is only transient. The above action is easily explained by the formation of sulphuret of iron.

So far, so good; granting that a satisfactory negative results, what is the effect upon the original? No valuable document should be entrusted to an unreliable photographer, or one who would imperil the original by chemical manipulations. All such risks should be avoided, as the desired result can in almost all cases be achieved by purely photographic means.

We have had a large experience in this particular branch of photography, and always avoid anything which, even in the most remote degree, might work a permanent injury to the original.

In copying subjects of this kind, a slow plate,—short exposure, and development with Ferrous Oxalate, will usually bring about the desired result. In difficult cases an eikonogen developer is often of service.

When the MSS. is very much faded or discolored, and all other methods fail, the following has given excellent results: Develop with a combined eikonogen and hydrochinone developer until the detail is well out, then fix in acid fixing-bath, wash well, and when thoroughly dry, bleach out with the usual bi-chloride mercury and sal ammoniac solution, wash in running water for 15 minutes and when dry place in front of a dead black surface and photograph. The resulting negative can then be, if necessary, intensified. Excellent results have been obtained by this method. The greatest advantage of all being that it works no possible injury to the original. J. F. SACHSE.

MELVILE BAY, LAT. 75° 40′ N.; LONG. 66° 30′ W.
NEGATIVE MADE BY MIDNIGHT SUN, 12 A.M., JULY 16-17, 1891, BY BENJAMIN SHARP, PH. D.

HUNTING IN MELVILLE BAY.

BENJAMIN SHARP, PH. D.

THE Kite, which left New York on June 6th, carrying on board the two exploring parties, that of Lieutenant Peary and that of the Academy of Natural Sciences, of Philadelphia, entered the ice of Melville Bay on July 2nd. This part of the world is well named the battle-ground of the Arctic Explorer for here, besides the attending dangers, we encountered delays and most aggravating waits. Our stay in the ice pack of Melville Bay was three weeks, during which time we had ample opportunity of studying the intricate method of ice navigation; how the little steamer would enter a "lead," run its length and endeavor to break its way or "butt" into another; how the floes would close at the change of the tick and with no possibility of proceeding would "tie up" and rest until some change would open the "lead" in front of her.

Gradually, but very gradually, the "Kite" progressed northward, running into dangers and luckily escaping; once she was very nearly crushed or "nipped" to use the technical expression. One afternoon while endeavoring to pass into a long "lane" ahead, she stuck fast in a narrow channel between two very large ice floes—she could neither advance nor retreat, and as the floes seemed to be coming together there was great danger of having her sides crushed in by the tremendous force of the moving floes. Everybody on board immediately got overboard on to the ice, armed with axes, picks, crowbars, etc., and endeavored to cut a channel for her so that she could be taken out of her dangerous position. Holes were dug in the ice; a bottle of powder tied to an oar and this lit with fuse was shoved in under the ice. After a few blasts, we had the satisfaction of seeing the vessel move into clear water.

This incident proved in the end to be a lucky one for us, for not long after everything was in order, one of the sailors sighted a "water bear" as they call here, the white or Polar bear. He was about half a mile to windward of the ship and

slowly walking toward her. Every rifle was seized and soon every one crouched down behind the bulwarks waiting for his approach. Occasionally he would stop and look carefully at the ship, then walk on a piece, to halt once more. When about one hundred yards away he started at a full run for us, but had not proceeded far before he received a volley from the gunners. He fell forward and rolled over; streams of crimson ran from him staining the ice. In a moment, however, he recovered from the shock, slowly rose to his feet, and made for the water astern of the ship. At this all those who were armed jumped over onto the ice and gave chase, firing as they ran. The bear, however, gained the water, where he plunged in and made for the other side of the "lane." One of the best shots of the party took careful aim and pierced with his bullet the brain of the bear. A boat was lowered, the bear towed in and dragged upon the ice where several photographs were taken of him, and as it happened they were taken at midnight, the sun, although somewhat obscured by clouds, stood about as high above the horizon as it does with us in September at about four o'clock in the afternoon.

THE MARCH OF THE CAMERA MEN.

IF we were asked what was one of the most striking features of yesterday's Bank Holiday, we should answer, "the march of the camera men into the country," if we may use such a phrase to describe the invasion of every sweet, sunlit, secluded spot near London by swarms of amateur photographers. One saw them in all guises at railway stations, on steamers, and in 'busses, in traps and on bicycles and trycicles. They were in every kind of marching order, heavy and light. Earnest votaries, bent double under weighty impediments, were taking their holiday seriously—pensively musing, we dare say, on the provoking but fascinating uncertainty of their art. There was also a light division who mustered in great strength, and who were ubiquitous. They embraced all ranks, from the luxurious devotee, armed with the magical "artist's" camera, the Cockney optician's pride, to our old friend 'Arry,

whom polytechnics are already beginning to influence, equipped with his little "demon" or "instanter" detective apparatus—"only five-and-twenty bob, and blooming cheap at the money, too." His friends, who see themselves as this depraved instrument limns them in distorted form, assure 'Arry that it is not only "blooming cheap," but "blooming nasty" also. On road and rail and river, in quiet rural lanes, up winding sea creeks that pierce the soft mud-flats of the Essex shore, in crowded locks, in umbrageous woods, on glassy broads, in the tumble-down streets of sleepy villages, in the peaceful graveyards of crumbling country churches, in ruined castles, on breezy downs, and rolling up-lands—yea, even in dismal swamps beloved of snipe and plover—there you might yesterday see adventurers of the camera clan busily hunting up the picturesque, and wistfully persuading an unwilling sun to record it for them in the dark recesses of their uncanny apparatus. Ours is an age of fads and crazes; and the characteristic fad of society this season has certainly been the craze for amateur photography. The malady has long been steadily on the increase in England, especially among the middle classes, but it has not been till this year that it has affected the aristocracy and the Court in a serious epidemic form. That it is a highly contagious affliction may be illustrated by a piece of amusing Court gossip that has not yet found its way into print. When the Prince of Naples came amongst us he was entirely innocent of all yearning to be a sun-painter. He had not, however, been here more than two or three days when he was seen every morning, *incog.*, toiling in the Stereoscopic Company's School of Photographic Art in Regent Street—the chosen home of the amateur photographer—as if his future livelihood might one of these days depend on his skill. In fact, he returns to town partly because he wants to continue his studies under the guidance of Mr. Mitchell, the energetic and ingenious director of the school. They will be shared now by several members of his suite, whom, somewhat to their regret, his Royal Highness has requested to acquire this plebeian craft, so that they may, when the humor suits him, take on themselves the burden of irksome technical details. It is

no secret from whom the Prince of Naples caught the contagion of amateur sun-painting. It was from the ladies of our own Royal Family, whose recent achievements in the art have furnished every fine ladies tea-table in the West End with æsthetic gossip and small-talk during the last few months.

But when Royalty takes up a fad like this and society follows in its wake, and the democracy insist on having their "look in" as well as society, unexpected economic results are sure to follow. It has been so in this case. During the last year every trade meeting of photographers has rung with complaints of bad business, and the columns of their trade journals are doleful with wailing over vanishing profits. They will have it that the "deep-dyed amateur," as the late Henry John Byron called him, is killing the photographic business, and if this predacious person were to be discovered by a professional with his hand camera "operating" in a quiet place there would be a collision, which would probably end in their fragments being found impartially mixed with splinters of wood, broken glass, twisted screws, torn "films," and shattered "view finders." As photography is not only an art, but a trade which gives employment to vast numbers of deserving persons, it is disagreeable to hear that it is being ruined by a predatory raid of the camera men. But is the situation really so desperate after all? If professional mediocrities who refuse to adapt their business to the changed conditions of the time are to be extinguished by the amateur's rivalry, has he not, on the other hand, created quite a new development of industry? Has he not set up, and does he not keep going, great establishments that manufacture his chemicals and his "plant"? Has not a vast amount of capital been sunk in this enterprise? Moreover is it not one that the professional can combine with his own? Whatever answer be given to these questions, we must face this fact: the "deep-dyed amateur" has come to stay. As an individual, of course, he has always existed; indeed, the creators of photography—Watt, Daguerre, Fox-Talbot—were all amateurs. But as a class capable of supporting a new branch of mechanical and manufacturing industry he only became discernible in 1866.

It was in that year that the Lord Mayor Nottage, who founded the Stereoscopic Company, discovered him, and organized the first exhibition of amateur photographic art worthy of the name ever held in this country. How the Lord Mayor and his project were "chaffed" at the time, and with what anticipations of fun was it visited! Yet all the critics who went to scoff remained to praise, and the startling revelation of the amateur's artistic power in manipulating photographic processes, especially in landscape work, caused universal amazement. Every succeeding exhibition has increased the muster of the camera clan till they are now almost as formidable in their numbers, and as far reaching in their agencies, as the wheelmen themselves. The late Lord Mayor foresaw this development and accordingly, under his direction, the Stereoscopic Company took the bold step of organizing a Technical School of Photographic Art in Regent Street, where it gave free private lessons to everybody who was "a customer." This school has now, however, developed under the direction of Mr. Mitchell, a pupil of the Edinburgh Technical College, into a public institution. The pressure on its teaching accommodation has become so embarrassing that it is just now being rebuilt on a sumptuous scale, as a sort of Technical College of Photography, the inevitable and natural result of running it on popular lines. Here, then, is the first startling fact to note. It actually paid the Stereoscopic Company to put "dark rooms" and studios and artistic and scientific teachers at the disposal of amateurs for nothing, and why? Simply because the amateur, when bitten by the "fad," naturally buys all sorts of things necessary for his art from them, and on this a handsome profit is no doubt earned. Why, then, should it be contended that the amateur ought to be "boycotted" by the trade as a pestilent competitor, and that the manufacturers who supply him with "plant" should be blacklisted? Handled with tact, as he was by the late Lord Mayor, the amateur, it is clear, may be made a source of revenue and not of ruin to the professional. But be that as it may, the amateur is a great fact, and we do not believe he can now be suppressed by any trade combination. The truth is, the progress of science and

culture is evolving him. So long as photography was a mixture of stinks and stains the professional and the leisurely fanatic were left to monopolize it. It ceased to be a nasty process with the invention of "dry plates" capable of receiving a sun-drawn image, which could be brought and fixed by colorless developing chemicals. Still, the professional had the advantage, because he knew all about "exposures" and composition, and could afford time to get both to come right. We, however, changed a great deal of that when the hand camera was invented, and still more when the detective camera that takes a picture with a snap-shot was contrived. The difficulty of composing was, however, still considerable, but even that was recently got over when the diabolical twin-lense hand camera was invented—the seductive instrument that lured Royalty to the Stereoscopic Company's School of Art, where it is used for teaching purposes, and is supposed to do everything but deliver the lectures. This necromantic little apparatus looks as if it belongs to the "black art," and its popularity with artists is easily accounted for. It has two lenses, one for throwing the picture on the sensitive plate inside the box, and another for projecting the exact image of it on a ground-glass window on the top. Thus the amateur, when he looks down on it, sees at a glance exactly how his picture inside will look, and he can shift it and alter its composition, and keep on focussing it all the while with the utmost ease till he gets it to his exact liking, whereupon he pulls a string, and then with a click the "exposure" is made, and why—"there you are." When the Princess Christian was made a proficient in a few lessons by this camera the Princess Louise followed her example. To her succeeded the Princess Henry of Battenberg, and to her the Princess of Wales, after which we need not say all the world and his wife went for it with undiscriminating enthusiasm. It might, therefore, well be called the "Royal detective," or imperial "demon," since even foreign Princes who visit us cannot resist the spell.

What is to be said, however, of the bitter complaints of the professionals against their amateur competitors? Why, simply this, that they are grossly exaggerated. For nine ama-

teurs out of ten photography remains, and will ever remain, in spite of dry plate and twin-lense cameras, a more or less trivial diversion. For the tenth, who has patience, scientific knowledge, artistic culture, and plenty of leisure, no doubt it will be a fine art, in the practice of which he will find an exhaustless source of refined enjoyment, and in certain departments even beat the professionals out of the field. In landscape and genre figure pictures that tell a story or embody a sentiment or a flash of humor, the artistic amateur can outstrip all competitors. But photography of this sort is an art that is as long as life is short, and the ingenious youth who thinks its triumphs are to be won by "snap-shots" with detective cameras, taken on "dry-plates" from the back of a bicycle, and then sent to a professional to develop, is doomed to sad disappointment. "To pull the string and leave the rest to the professional" is the popular ideal of amateur photography on Bank Holiday. Hence the camera men who do not develop their own plates, and work at the art as artists and enthusiasts, have to be thankful if they get one decent picture out of every dozen plates they expose. In truth the real photographer will tell you that even he is never certain of a good result. He will tell you that the finest negative you can get will only yield in reproduction—no matter how many thousand copies you print—one picture which is perfect in tone, density, delicacy of feeling, and truth of sentiment, and some of the great amateurs now go so far as to destroy their negative and all prints from it whenever this ideal impression is obtained, so that in time, as the art attracts the collector, these specimens will have a unique preciosity. It is, however, a ghastly hallucination to suppose that work of this sort, which alone can push aside the pictures of the professionals, is likely to result from "snap-shots" taken by rollicking yachtsmen, fashionable oarsmen, or racing bicycle riders. The real truth is the snap-shot detective camera of the amateur is a most fickle implement, with a very limited range of utility. You dare not trust it unless the light is in full brilliance. With less light than that you need long exposure, and it is not possible to keep a hand camera perfectly steady all the time of a long ex-

posure. In portraiture, however, where technique reigns supreme, and which is the really paying branch of the profession, no amateur, however artistic, can ever hope to compete with the professionals. The average amateur who has in a weak moment taken the portrait of a maiden aunt from whom he has expectations, only does so to regret it with bitterness when the old lady's will is read after her funeral. When he photographs his *fiancee* he may just as well be prepared for the breaking of his engagement. Still we do not desire to see the amateur discouraged, even though he may at the outset of his career outrage his friends by insisting on photographing them. His pursuit is one which when confined to its appointed limits—and he soon learns to know its limits—gives our young men and women an additional interest in the beauties of their own country. It fills them with an ever-increasing zest for home travel. It is indirectly the means of making many of them who would otherwise go through life in darkness, view nature with the artist's eye, and love her in her ever-varying phases with the poet's heart. Many who take to the hand camera, as if playing with a toy, are led on gradually to follow the higher flights of the art, and then they thus help to strengthen the forces that are brightening, beautifying and imparting fresh interest to dull work-a-day lives.—*Daily Chronicle.*

It too often happens that the inventor of a good thing gets very little either of credit or profit out of it, the shrewd man of business coming in and possessing himself of both. We were reminded of this truth the other day, when we saw, in a French photographic journal, the description of a "new" dark back for films. This back does not open book-fashion in the usual way, but has a space inside filled in with a removable partition of ebonite. Over this flexible slip is folded a double band of film, sufficient for two exposures, and the partition is replaced. This *new* device was patented in Great Britain about eight years ago by Mr. Nergara, when that gentleman was doing his best to introduce the unfortunate Woodbury film to the notice of photographers. The idea is a good one, and Mr. Nergara should certainly retain the credit for it.

SOME EXPERIMENTS TO DETERMINE THE LIMIT OF VISION AS RELATED TO THE SIZE OF THE OBJECT OBSERVED.[1]

PROFESSOR M. D. EWELL, M. D., LL. D.

IN Vol. I of Tiddy's Legal Medicine, page 248, we find the following statements:

"With respect to the smallest objects recognizable by the unassisted sight, there has been much difference of opinion. Carpenter states (apparently on the authority of Ehrenberg), that the smallest square magnitude, black or white, which can be seen on a ground of the reverse color, is about the $\frac{1}{166}$ to the $\frac{1}{54}$ of an inch, while particles that powerfully reflect light, such as gold dust of the $\frac{1}{1125}$ of an inch, can be seen with the naked eye in common daylight. Bergman found that black and white checkers of $\frac{1}{25}$ an inch square could be discerned at such distance that the retinal image of each square could not have exceeded half the diameter of one of the cones of the bacillary layer, which are said to have a diameter of $\frac{1}{171}$ of an inch[2]. Dr. Vincent de Guéret (of Creuse) in 'La France Medicale,' (No. 57 for 1875,) states that objects to be seen at all must have a diameter of the $\frac{1}{250}$ of an inch.

"*Lines* are more easily perceived than *points*. Thus opaque threads of the $\frac{1}{166}$ of an inch (*i. e.* about half the diameter of silk worm's fibre) can be discerned by most people with the naked eye when held towards the light[3]. Volkmann (quoted in Funke's Lehrbuco d Physiologie) considered that parallel black lines could be seen when the $\frac{1}{106}$ of a millimetre apart ($\frac{1}{254}$ of an inch)."

Passing from microscopic objects, we note that at a distance of one foot a person with normal sight can scarcely see any object less than one twenty-fifth of an inch. At greater distances the size must increase comparatively.

This statement seems so much opposed to my experience that I have submitted the following described tests to nineteen

1 Read before the Am. Soc. Microscopists.
2 This compounds to a distance of 27.77 from the eye.

different persons of ages ranging from seventeen to upwards of fifty with the results given in the accompanying table.

No. 1. consisted of a piece of black paper approximately one mm. (one-twenty-fifth inch), square pasted upon a white back-ground. No. 2. consisted of a similar white square upon a black back-ground. No. 3. consisted of a black line approximately one mm. broad upon a white back-ground. To be exact the dimensions of No. I. were 1.08 mm x 1.04 mm; No. II. 1.08 mm x 1.98 mm. No. III. 1.12 mm in width.

The manner of making the tests was to hang the cards in a good light, not artificial, and approach them from such a distance that they were invisible, and note the respective distance at which they became visible, and at which the shape of the squares could first be defined.

The accompanying table gives the results of several tests: The first column gives the age, the second the condition of eyes when known, the third the distance in feet and inches at which the black square first became visible, the fourth the distance at which the black square could be defined, the fifth and sixth give the same particulars as to the white square, and the seventh gives the distance at which the line first became visible.

A large number of other tests were made with another set of cards, but unfortunately one of the students lost them before they had been measured, so that the results are not in the table. There are however, a sufficient number of observations to show pretty nearly the average limit of normal vision and to demonstrate the gross inaccuracy of the above quotation from Dr. Tiddy's work.

3 In the experience of the writer, lines very much smaller can be readily made out by the average eye. A line ruled on glass or metal, which is less than 1/6 in diameter is distinctly visible. Professor Rogers states that he has seen lines one one hundred and fifty thousandth inch in diameter, and this with the unaided eye. Diffraction undoubtedly has much to do with this result.

SOME CHARACTERISTICS OF GOLD.

PURE gold is so soft that it would soon be worn away by use; it is always alloyed with a varying proportion of copper or silver, usually about one-tenth. Pure gold is said to be 24 carats. Thus, 18-carat gold contains 18 carats of the pure metal in 24, or is three-quarters pure. Many cheap alloys of base metals can be made which very strongly resemble gold in color and lustre; but, in the absence of a chemical test, the high specific gravity of gold (19.3) is the test of its purity, though this has been ingeniously imitated by covering the heavy, but cheaper metal, platinum, with a layer of gold. Iron pyrites and other yellowish minerals are constantly being mistaken for gold by inexperienced persons, much to their disappointment, but a very simple test will show whether a doubtful specimen is really the true metal. Gold is very sectile—that is, it can be cut and shaved with a knife, like a piece of wood or horn, while pyrites and other worthless minerals will crumble under the knife blade like a lump of sugar. If any reader of this article ever finds a yellowish mineral which can be cut without crumbling, it is worth a more thorough test; otherwise he may as well save himself unnecessary trouble and disappointment. Very few chemicals have any effect on gold. Selenic acid will dissolve it, but few chemists have ever seen this very rare substance. A mixture of nitric and hydrochloric acids (aqua regia) will also dissolve it, forming a chloride of gold; and so will a solution of chlorine gas in water. In both of these liquids a peculiarly active form of chlorine, known as *nascent* chlorine, is present, which probably unites directly with the metal. Gold, like all the noble metals, is unchanged by heating in the air. Its oxides can be obtained by chemical reactions, but they are very unstable and easily reduced back to the metal. The chloride above referred to is the only salt of any practical importance, and is used to produce the beautiful Purple of Cassius, a compound of tin and gold of uncertain composition, but yielding a magnificent ruby color when melted into glass. A hundredth of a grain of gold will deeply color a cubic inch of glass. The most extensive use of the chloride is, however, in photography, where it is used to "tone" or color prints on silvered paper. This darkening of the prints is due to the decomposition of the salt and the deposition in the picture of finely divided metallic gold, which not only gives it the desired color, but renders the image very prominent. By beating out between pieces of membrane, gold may be formed into leaves of such thinness that 282,000 of them

will only make a pile one inch in height. A single ounce of gold may thus be spread over 100 square feet. In the manufacture of gold thread for embroidery, a cylinder of silver is covered with gold and is afterwards drawn out into wire. In this way six ounces of gold have been made to yield over 200 miles of gilt wire. Even at this extreme tenuity the coating is perfect and does not rust or tarnish.—*Popular Science Monthly.*

NEW USE FOR THE CAMERA.

AMERICANS should by all means, both men and women—when their mouths have assumed the mature expression, with all their teeth perfect—have their mouth and teeth photographed, so as to insure that the artificial dental artist shall get the correct physiogomy when his services have to be called in. There is so much expression in the teeth; the entire face can be altered if a dentist furnishes the jaw with a widening, flattening row of large handsome ivories to replace a curved and slightly irregular row of tiny, natural teeth. The extreme change in the expression so produced requires almost another lifetime for one's friends to become accustomed to. The fact is the dentist's idea of teeth is that of a regular fence of polished and gleaming material, although considerable attention is now paid to coloring—yellowish or blue (pearly) teeth being now manufactured with wonderful likeness to nature. But the shapes and sizes still require much modification and many irregularities to make them resemble the natural teeth, which have their characteristic differences from other people's and even from each other. How are the craftsmen in teeth to imagine these things?—as the mouth has lost many of its chief ornaments before even the dentist—who chooses from sample—is called to replace the missing pearls. To secure identity in your manufactured teeth, then, it is wise to photograph your natural ones, so that their expression and form may be preserved. The dental industry can do wonders, but it cannot match what it has never seen—so the camera, now a family toy, may as well serve in preserving the mouth, with its complement of teeth, as a guide to the dentist's future labors. False teeth need not be unnatural, nor would they—if made to match a photograph sample—give the wearer the cynical expression that sometimes replaces all others—when the workman has done his most ignorant best for your comfort, but not for your looks.—*Public Ledger.*

NEW PROCESS OF MAKING PRINTING PLATES.

MR. FR. WINTERHOFF, of Cologne, has patented a process of making glass printing plates for typographic and lithographic purposes, which will, I think, be of interest to photo-lithographers. It consists in the following;—A glass plate is coated with a sensitive solution of asphaltum, or with bichromated gelatine, and dried; a print is then taken from any printing plate—from a negative, for instance—on a well-prepared transfer paper, which is then transferred to the glass plate provided with the sensitive layer. The transfer paper is then removed, and the transferred print on the glass plate dusted with metallic powder—for instance, with bronze or leaf metal—when the plate is well cleaned. It is then exposed to sunlight for about half an hour, and washed with turpentine, which dissolves the unexposed parts of the layer, whilst it leaves unaltered those portions which have been exposed to light. The plate is then etched very deeply with fluoric acid for about half an hour, rinsed, and cleaned, when it may be used as a printing plate. From this plate, transfers may be made at any time, to be transferred to stone or to zinc, or the plate may itself be employed directly as a printing plate without fear of wear and tear. These plates afford a very practical substitute for the expensive lithographic stones or zinc plates.

Blisters in Gelantino-Bromide Prints.—Blisters are sometimes met with in work with gelatino-bromide paper. To avoid them, the *Photogr. Archiv* suggests the following procedure. It is necessary to use the water and the various baths as cold as possible, and to do the work in a laboratory the temperature of which is not above 68° F.; use should also be made of alum. After development, the print is washed for a few seconds in two water baths, when it should be placed for three minutes, picture side down, in a bath of

Water	200 c. c.
Alum	12 grammes.
Common salt	6 "
Soda	1 gramme.

The print is then allowed to drain, and, *without washing*, placed in the fixing bath. The latter consists of

No. 1.—Water	200 c. c.
Hyposulphite of soda	30 grammes.
No. 2.—Water	40 c. c.
Alum	12 grammes.

The mixture of the two solutions is allowed to stand for a day. In this bath the print should remain five minutes in summer and fifteen minutes in winter, during which time it should be repeatedly turned. It is then, *without washing*, placed in the already used alum bath, with the film side down. This alum bath should not be used again.

Platinum Printing.—R. Wischeropp recommends the following platinum printing-out process. It is essential to use a chemically pure ferric salt, and to dry the solution as quickly as possible after its application to the paper, in order that it may not penetrate into the paper. For this purpose a dry box is necessary, kept at a temperature of 133° F., so that the prepared paper placed in it may dry within two minutes. The solutions required in this process are, according to the *Phot. Nachrichten*, the following:—

Solution A.

Sodium ferric oxalate	40 grammes.
Sodium oxalate solution (3 : 100)	100 c. c.
Potassium chlorate	0·1 gramme.

Solution B.

Distilled water	60 c. c.
Potassic chloro-platinite	10 grammes.

In Solution A the solutions, which are kept separately in the Pizzighelli process, are united; then the addition of glycerine, which is declared needless by the author, is left out. Solution B keeps indefinitely, whilst Solution A should be renewed from time to time. To sensitise one sheet of arrowroot paper, 8 c. c. of Solution A and 5 c. c. of Solution B are required. The sheets of paper are fastened with drawing pins to two wooden strips, one of which projects sufficiently to enable the sheet to be placed on the edges of the dry box. The latter is made of sheet iron, and is warmed by a gas boiler, the paper being suspended in it in such a manner that the second wooden strip remains about four inches distant from the bottom of the box. The solution is quickly applied to the paper with a bristle brush, spread with a round badger-hair brush, and then the sheet is quickly hung therein. In order that the paper, after drying, may give brilliant prints, it should be kept for some time previously in the dark room. It is then laid, together with the negative, in the printing frame, and covered all over with india-rubber cloth. As soon as the desired tone is attained, the print is fixed in a solution of hydrochloric acid 1 : 80. The fresher the paper, and the more quickly it is worked, the more beautiful will be the tones of the prints. For this reason it is advisable to print in direct sunlight.—*Photographic News.*

A TRIUMPH OF MODERN PHOTOGRAPHY.

DURING the past summer Mr. Wm. H. Rau, the well-known Philadelphia photographer, has been egaged in making negatives of the picturesque scenery along the Pennsylvania R. R., between Philadelphia and Pittsburgh. The result of this outing sums up over four hundred negatives, the majority of which are on glass 18x22. The others which may well be called triumphs of modern photography, were taken on flexible orthochromatic films 18x48 inches, and were made on special films in a camera of Mr. Rau's own constuction. This was built especially for this work on the panoramic principle as originally applied in France in 1855. NOTE.—(vidi Secretau, De la distance focale des Systemes Optiques con vergents, Paris 1855).

The films were in semi-circular holders of brass and celluloid, and the view covers almost 180°. The lense used was a Ross portable Symetrical of 15 inch focus. The camera was mounted on a tripod with the finest adjusting screws and ball bearings. In making these exposures Carbutt's Orthochromatic films and the Eastman paper were both used.

After the camera and its parts were completed, new and unexpected difficulties presented themselves. It was found that every utensil requisite would have to be especially made. For instance, there was not a developing tray to be had in the country to develop the exposed films, nor to print the positives if the negatives were made. To overcome this difficulty three trays were made of wood coated with non-absorbents; the expense of these alone was $50. The printing frames with their plate glass fronts were even more costly. The resultant pictures, however, well warrant the expense and outlay. Another matter of interest is that all the exposures were made and results obtained without the use of a color screen.

The railroad company offered Mr. Rau every facility to ensure the success of the trip. Independent of the photographic car constructed for Mr. Rau a special engine and crew was furnished him, and also all necessary help in transporting the apparatus.

The "Photographic Car" was an ordinary passenger coach, with the seats removed, and fitted up in three compartments, viz: A baggage room and living room, with a dark room in the centre, with a passage of 18 inches running along one side of the car, connecting the two other compartments.

The dark room in which our chief interest centres was thoroughly

equipped with lockers, partitions, shelves and drawers. It was lighted by two ruby windows, which were arranged to admit white light if necessary; at night the usual ruby lanterns were used. Over the baggage compartment a large iron tank had been introduced, which furnished a plentiful supply of water. The dark room was well ventilated and contained every requisite for comfort.

The baggage room was what the name implied, and contained the plates and apparatus, which was all compactly fitted into trunks that could be transported in wagons over mountain roads.

The opposite end of the car was fitted up as a living room, furnished with easy chairs, bedding, bric-a-brac, etc. Facilities were also introduced for cooking in case the necessity should arise.

Another peculiar feature of the car was that it was fitted with brakes locking from the inside, a precaution necessary to prevent the car from running away at night if on a grade, or tramps tampering with the brakes from the outside.

The specimens which we have seen, prints and negatives, certainly mark a new era in picturesque photography. J. F. S.

Cold Rolling vs. Hot Burnishing.—In the early days of photography it was frequently recommended to iron the prints with a hot laundry iron with the view of rendering them more permanent. At the present time many are under the impression that hot burnished prints should be more stable than those which are cold rolled. Heat may conduce to stability, but it must be borne in mind that the great pressure applied in burnishing forces the print into more intimate contact with the mount than is the case of simple rolling. Therefore, if the mount contains deleterious matter, there will be no advantage, so far as permanence is concerned, in the former treatment.

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Reference to the subject of permanence brings to mind that a process is still badly wanted by which a faded paper picture can be restored to its original state. In a faded print, however badly it may have gone, we cannot but imagine that all the material—gold and silver—that once formed the image is still in the paper, though in an altered condition. Why, then, should it be impossible to bring it back to its pristine state? Whoever discovers a method of accomplishing this will be a benefactor to photography.—*The British Journal of Photography.*

WARM TONES IN BROMIDE PRINTS.

BY W. ETHELBERT HENRY.

IN dealing with the production of warm tones special skill is unnecessary, in fact, it is far simpler to effect the tone than produce the print itself. At the same time it must be understood that *absolute* cleanliness is an essential, without which labor and material are wasted.

Prints developed by means of a quinol and potash formula lend themselves particularly to this mode of treatment, those developed by the iron developer being usually too grey to take the tones so effectively. Again, a most important factor, and one to be specially borne in mind at the outset, is the depth of the developed print. Generally speaking, a print that looks perfect in its range of shade is but a poor foundation upon which to build a warm tone, say a sepia or reddish brown. Let us then prepare the crude print (the print that is simply developed and fixed, but not toned) with special regard to the after operations.

We will assume that the developer has been prepared in accordance with the formula (No. 1) appended; that the fixing solution is also freshly prepared, and the necessary chemicals for toning are at hand ready for admixture.

The first principle of the process is a liberal exposure, such a one as will result in a somewhat *flat* print: that is to say, dealing with a paper whose normal exposure with a normal developer is estimated at ten seconds, one foot from a No. 5 Bray's fishtail burner, we must give at least twenty seconds exposure. The development must not be hurried, and should take from ten to twenty minutes in its accomplishment, as the use of a weak developer (*not a restrained one*) is imperative.

When development arrives at that stage in which all the details are up, and a moderate amount of density prevails throughout, the print may be passed through a dish of plain water for about a minute (simply to rinse off the excess of adherent developer), and transferred directly to the fixing bath. If a number of prints are dealt with at the same time, they may be developed about ten at a time and passed on to the plain water, which in this case should be contained in an earthenware pancheon of large size, there to wait until the entire batch of a hundred or more is ready for fixation.

Dr. Just claims that his bromide paper is completely fixed by one minute's immersion in a hypo bath of weak strength; this I do not in

any way dispute, but I prefer to give all papers (even his) a sufficient time, for *thorough* fixation eliminates one of the most common causes of fading. Let the prints remain in the hypo bath for fifteen minutes and see that they are constantly turned over during that short time, and not left to stick together in such a lump as to render fixation utterly impossible. After fixing the prints they must be most thoroughly washed in constant changes of water for at least an hour, otherwise the fine details will be completely eaten out during the toning.

When the hypo salts are entirely washed away, and the toning dish (reserved exclusively for uranium work) in place, the bath may be mixed according to the formula (No. 2), but avoid mixing this bath until ready to make use of it, as it rapidly deteriorates.

Place the prints two or three at a time in this bath and keep them in constant motion until the desired color is attained, which will be in about five to fifteen minutes, according to the particular degree of warmth required. Note that the tone in this case gradually becomes warmer (the reverse of other toning processes), running from a brownish black, through the sepias, to a bright reddish brown, almost approaching to "Bartolozzi red," but at the same time the high-lights of the picture become much discolored. When the desired color is attained, transfer the prints to successive baths of plain water, where they must be constantly moved until the high-lights are sufficiently clear, which should be accomplished in about twenty or thirty minutes, but may, in some cases, take longer. Directly the whites are clear, the prints may be removed, the surplus water blotted off with a suitable material ("Robosal" preferably, because it leaves no "fluff") and hung up, or laid flat, to dry.

There is no necessity to wash the prints beyond the "clearing" stage, for the simple reason that it is sufficient indication of the removal of all deleterious substances from the body of the print, and further washing is liable to obliterate the tone altogether. This is a positive advantage; because, supposing the tone has been carried, in error, to a brighter brown than is required, extended washing will leave the print almost in its crude state ready for re-toning. Another point worthy of notice is that the alum bath is apparently unnecessary owing to the tanning action set up during toning.

Although I have for some years made use of a similar process for special intensification of negatives, I must acknowledge that the researches of Mr. H. Weir Brown first induced me to apply the process to toning bromide prints.

Formula No. 1.

Stock Quinol Developer, will keep indefinitely.

A.

Hydrokinone	720 grains.
Bro. potassium	135 grains.
Sulphite soda	9 ounces.
Water to	90 ounces.

B.

Soda carbonate	13½ ounces.
Potash carbonate	13½ ounces.
Water to	90 ounces.

To develop negatives use equal parts of A, and B, without dilution. For bromide prints, add to each ounce of the mixed developer from one to one-and-a-half ounce of water.

Formula No. 2.

Uranium Toning Bath, to be mixed only as required.

Uranium nitrate	20 grains.
Potassium ferricyanide	20 grains.
Acetic acid	1 ounce.
Water to	20 ounces.

—*Practical Photographer.*

Free Once More.—BERLIN, Sept. 7.—The American tourist, Carleton Graves, who was arrested on Saturday last at Mayence, on suspicion that he was a spy, has been released from custody.

[Mr. Graves is a son of Robert Graves, of Barnesville, Belmont, county, Ohio, but has been in the employ of the Pennsylvania Railroad Company at Broad Street Station, in this city, for several years past. He is an expert photographer, and was sent along the line of the road this summer to take views of picturesque points. When given a vacation, he went to Germany, and took his camera with him.]

Photographic Hints and Formulæ.

Varnish for Negatives.—M. C. Fabre in his *Aide-mêmoire de Photographie* gives the following formula for a varnish that can be applied to photographic films without being obliged to dry them; it suffices simply to allow them to drain: Dissolve 8 grammes (123 grains) of borax and 2 grammes (31 grains) of carbonate of soda in 160 c. c. (5 fl. oz. 3 drachms) of warm water; add 32 grammes (8 drachms) of broken gum lac, stir until perfect solution, filter, then add from 1 to 2 c. c. (16 to 32 drops) of glycerine and enough water to bring the volume to 320 c. c. (10 fl. oz. 6 drachms.) In a few hours a deposit is formed which is caught on the filter and the varnish is ready for use. Varnishing is done by either immersing the negative in the varnish, or coating it with the liquid; in the last case it is necessary to repeat the operation at least twice. This varnish costs but a mere trifle.

Cheap Toning Bath.—An English correspondent sends us the following formulæ: With an old acetate toning bath we obtain warm purple tones with 2 grains gold for every 60 cabinets, equal 4 sheets or ½ grain gold to the sheet of paper. Practice, after 3 or 4 waters, or rather after the prints no longer give any definite trace of silver in washing, 2 ozs. of a saturated solution of washing soda are poured into a dish of clean water; the prints immersed one by one and well turned over for 5 or 6 minutes. This water is carefully drained off and fresh placed in the dish; the toning bath is poured out, 2 grains of gold added, mixed in with the hand, and by the time the prints have begun to separate in the washing dish, 20 or so are picked up one by one and thrown on to the left hand and *well drained*, then thrown face down into the toning bath in a flat mass; another 20 are treated in a similar manner, and the whole lot turned face up and the third 20 are added. Toning takes about 20 minutes.

Mr. H. P. Robinson has put it on record that he has used but one form of developer from the commencement. It is as follows:—

No. 1.

Pyro	1 oz.
Citric Acid	40 grains.
Water	7½ oz.

No. 2.

Bromide Potassium	120 grains.
Water	7 oz.
Ammonia ·880	1 oz.

Take 3 oz. of water and add 1 drachm each of No. 1 and No. 2.—*Scraps.*

Non-Poisonous Intensifier.—Soak the negative in water till soft, then drain and immerse in a bath of—

Ammonia	30 c. c.=1 ounce.
Water	30 c. c.=1 ounce.

for a minnte and a half, and then place in—

Cadmium bromide	1 gramme=15 grains.
Alcohol	1000 c. c.=35 ounces.

till sufficiently intensified.—*Practical Photographer.*

Blue-black Tone in Prints.—In *Photography*, according to F. W. Walker, it is an easy matter to obtain a beautiful Blue-black tone by the following method: Obtain the Fabrikmarke, three star brand, sensitised paper, white, 8d per sheet (by Oscar Scholzig), cut it to size and fume it for 15 minutes, then print deeply; after, place prints, face downwards, into a bath of common washing soda ½oz, water 10ozs. (warm), for one minute, then wash off the milky water, transfer it to the toning bath—phosphate of soda 20grs., gold solution 1 dram, water 8oz. The prints will tone at once. Then wash for about another minute, and place into fixing bath—hypo. 1oz., water 8oz., ammonia (·800) ½ dram, for 15 to 20 minutes; then wash gently and place in water 20oz., common salt 1oz. for one minute, and finally wash in a "proper washer," one hour will suffice. If blisters should appear, which I have not seen with this paper, place between red blotting paper, and hard pressure will soon dispose of them. The above baths can be made up and used at once (slightly warm). The phosphate bath will not keep more than a few hours.

Photo Transfers.—Place the chromate paper containing the photo for ten minutes between two sheets of paper, which have been saturated in a one-fifth solution of nitric acid in water. Upon the zinc plate place a piece of paper, which had been previously soaked in the nitric acid, and pull through the hand-press, which will cause a slight etching of the surface of the zinc plate. The sheet of paper is taken off, and all traces of nitrate of zinc are carefully removed from the zinc plate

by means of a blotter. The photo is then transferred upon the plate, gummed over, etc. It is then rubbed in with ink, which has to be thinned with olive oil, and when all details appear sufficiently strong, the plate is etched with a preparation made by adding a small quantity of phosphoric acid to a gum solution. When a drop of such a preparation placed upon a polished zinc plate discolors the same and effects its purity, then it is of sufficient strength.—*Photography.*

Iso-Vireur Paper.—M. Mercier has been endeavoring to do away with the toning operation by making sensitive paper which has in itself the necessary elements for obtaining an agreeable tone. Certain formulæ for a simultaneous toning and fixing have already been employed. M. Mercier introduces into the sensitising bath for the paper, certain chemicals which give it a good tone by means of the fixing alone. He shows some positives thus obtained with a preparation of nitrate of silver and of nitrate of uranium; the tone of these pictures resembling that of the best toned with gold. This is what M. Mercier calls *iso-vireur* paper. There may be cases in which it would be preferable to employ this paper rather than the ordinary sensitive paper.

The Photographic Society.—The Directors of the Photographic Society of Philadelphia have rented two large rooms in the Fuller Building, on Eighteenth street, below Market, which will give them four times the space they have in their present quarters, at 1307 Arch street. The work of fitting up the rooms will be at once begun. In the new quarters the Society will have a fine large room for library purposes, and a commodious meeting hall, together with spaces for working quarters, dark rooms, etc.

EDITORIAL.

OUR British contemporary,[1] in a recent issue, publishes the following, viz:

A HIGHLY humorous engraving appeared in the English art establishments two or three years ago. It was entitled "Witness my Last Act and Deed," and represented a playful kitten, during the temporary absence of the lawyer, upsetting a bottle of ink and rolling it over the elaborate will or testament just finished, and still spread out on the desk. We remember applying for permission to reproduce it on a lantern slide scale, offering to pay the full retail purchase price of the coveted print. This permission was not granted. In a recent issue of the *American Journal of Photography*[2] we find this same engraving reproduced by photography as its frontispiece, and we are glad to become possessed of it at such a cheap price. But what about the copyright? And how does the law apply as against the possessors of what is undoubtedly a piracy in this country? We know very well that copying of prints and engravings by photography or any other process is an offence within the statute, and that so also is the selling of a copy; we further know that the importation into the United Kingdom, of copies or imitations made abroad of any picture in which there is copyright, is prohibited; but what we want to know is—granted that the custom officers blunder in allowing prints to be admitted—have we not a perfect *legal* right to take advantage of such laxity, and retain, nay, frame, if desired, the mischievous kitten with its ink-besmudged testimentary parchment? From the point of *ethics* another view presents itself, but we confine our queries to the legal aspect of the case. Those competent to judge, affirm that cigars on which no duty has been paid smoke quite as pleasantly as if it had been, the axiom being, that once admitted into this country they are free. And so, we suppose, with piracies.

[In connection with above comment in the *British Journal of Photography*, which, by the way, was a genuine surprise to us, we will state that the original picture was brought to us about two years ago,—there was nothing whatever upon the print to lead us to believe that it was copyrighted; further it was the last thing we wished to do, to infringe upon anyone's rights in even the most remote manner.

The legal question raised by our British contemporary is certainly an

[1] Note from *British Journal of Photography*, Sept. 18, 1891.

[2] Note from AMERICAN JOURNAL OF PHOTOGRAPHY, June, 1891.

interesting one, and we should like to know the outcome of any similar issue if one be raised at any future time. In view of the new international copyright laws it behooves all parties concerned to be careful, as doubtless annoying entanglements are apt to arise even with the greatest circumspection and care, where no infringement was intended as in above case. It is as yet too early to judge whether the new act will prove of benefit to either country. The practical workings are as yet untried and will remain so until settled by judicial decisions.]

So far as the AMERICAN JOURNAL OF PHOTOGRAPHY is concerned we will but state that the publishers have always striven to protect the rights of others as well as their own.

Our Frontispiece.—Fairmount Park, September 1891,—a scene in Philadelphia's justly celebrated park—showing some of the beautiful floral decorations near Horticultural Hall, with the monument of Religious Liberty in the background, the whole forming a pleasing picture rarely equaled in any public pleasure ground in this country. The negative was made by Mr. Henderson with an orthoscope 8x10 lense, such as are advertised in this JOURNAL, on a rapid plate, 26 sens.—stop *f* 44—time, 1½ seconds. The development was with hydrochinone. The result well illustrates what can be done with a medium-priced lense, when in the hands of an intelligent operator.

Platinum.—Advices reach us from different European channels that the reduction in the price of platinum is likely to be permanent, a substitute for electrical purposes having been found. This, together with the advice published elsewhere of the expiration of the Willis patent, will be welcome news to the many photographers, professional and amateurs, who are favorable to the process. The first practical effect is that Dr. Adolf Hesekiel & Co., in Berlin, who manufactured the Pizzighilli paper, have reduced their prices fully 25 per cent.

Mr. G. L. Hurd, presented and read at the Buffalo Convention of the P. A. of A., an interesting poem in blank verse entitled "Shucks" for which a vote of thanks was tendered him. We regret that we were unable to reproduce it for the benefit of our readers, on account of its length and the pressure of other matter.

Solar Eclipse Negatives.—In the report on the Total Eclipse of the Sun, observed at Cayennə, French Guiana, South America, December 22nd, 1889, by Profs. S. W. Burnham and J. M. Schaeberle, of Lick Observatory, in California, the observers state

that the plates exposed during totality were leisurely developed in the course of three or four days following the eclipse. Every precaution was taken to secure the best results, so far as development was concerned. No practical photographer will need to be told that this part of the work is second to none in importance, and that where everything else has been properly done, a careless or unskilful development of the plates may seriously injure or ruin what would otherwise be a valuable negative. The best result can only be secured by a careful development of each plate on its own merits, and no expert would undertake to say in advance what would be the best method for a given exposure. This can be found by cautiously starting the development with a weak solution and carefully watching the result, and then modifying the proportions and strength of the chemicals to suit each particular case. It becomes then entirely a matter of judgment, derived from practice and experience, and no rules, except of the most general character, can be given for practical working, whether the subject of the negative be an eclipse or a landscape.

Photographic Restriction in France.—The French authorities it would seem are about to render France still more uncomfortable to the tourist photographer. The Espionage Bill, which it is proposed to pass, enforces penalties of a most severe description on spies of all kinds. If, for instance, anyone procures admission to a fortress, dockyard, man-of-war, or naval or military establishment by means of a disguise, false name, or untrue statement, and, acting as a spy, obtains information calculated to compromise the defence of the territory, he will be liable to condemnation to death; and the same penalty will be meted out to those who, for purposes of espionage, may have made surveys, drawings, or plans; organized or employed means of correspondence, or collected intelligence with the same detrimental object. If a hurriedly made plan or drawing subjects its author to death, what awful fate is reserved for him who produces the far more accurate and, therefore, more harmful photograph? We advise our friends to steer clear of France if this bill should become law.

Photographic Scissors and Paste.

Royalty and Photography.—Apropos of the talk about the annoyance that the nobility are subjected to by photographers, it is amusing to hear that the Empress of Germany, while staying with her children by the seaside in England, made frequent use of the snap camera. On one occasion, when a society reporter was trying to take her Majesty's likeness, he was suddenly surprised to find that the Empress was leveling her own private camera at him. Her Majesty laughed heartily at being detected.

The Princess of Wales is also becoming a proficient in amateur photography, and the practice of the art, like the will-o'-the-wisp, leads her to places picturesque enough in themselves, and where the "life" subjects are not so humbly loyal as trees and brooks. The other day for instance, her Royal Highness shipped across the Solent from the Isle of Wight in her yacht, and visited Porchester Castle, which is, to the jaded toilers of Portsmouth, a *rus in urbe*, the castle being one of the projecting points of the harbor. Just as the Princess pointed her detective camera in the direction of a group of pleasure-seekers in the enjoyment of bread and butter, a rustic lass deliberately stood in front of the camera, exclaiming, "Ah! you think you are going to futtygraph me and mother, but you won't." The joke was not lost upon the Princess, who laughed immoderately, and when the heinousness of the offense was pointed out to the urchin she was as crest-fallen as the Princess was amused. After this the photographing went on unimpeded.

Photography and Surveying.—Lieut. Reed, of the United States Artillery, stated in a recent paper that photography has been largely used for surveying in Canada under the direction of Mr. E. Deville, the surveyor-general. The Dominion survey made in the ordinary way proved very expensive and slow when the Rocky Mountains were reached, and photography was accordingly resorted to. The camera used, as described in *Engineering*, was a carefully made mahogany, brass-bound, rectangular box, half-plate size. When in use it was placed on a tripod furnished with leveling screws, and leveled by means of two ordinary tube levels attached at right angles to each other, and which could be placed on that face

of the camera which happened to be uppermost. The means for determining the horizon and principal lines were the images of four fine combs, one midway on each side, attached to the camera immediately in front of the plate, the use of small stops making these images clear. The lense used was a Dallmeyer wide angle No. 1 A of 5¾ inches focus, affording a horizontal angle 60 deg. when the plate was disposed with its longer edge horizontal. Six double plate-holders were employed. But one adjustment of this camera is required, namely, to insure the verticality of the plate when the tube levels indicate that the camera is level. The best way to effect this is to substitute for the plate a good plain mirror, face to the rear; then set up a transit in the vicinity. The axis of the telescope being horizontal observe a distant point intersected by the cross wires, also its image in the mirror; if the latter is also intersected, the mirror is vertical; if not, then the tube levels need adjustment. This box camera being rigid, and the focus therefore permanent and suited to distant views, and the lines on the faces indicating the field of view, no ground glass or cloth is needed. Care is taken to make the plate-holders exactly alike, a condition which, so far as distance from lense to plate is concerned, is ascertained by measurement. Orthochromatic gelatine plates give the best results. Mr. Deville considers that a survey made in this way is as accurate as a plan plotted with a very good protractor or made with a plane table. A good deal of attention has been devoted to the subject in France by Dr. Gustave le Bon, who has shown how to obtain all the survey details from a single photograph and one compass observation, provided any one distance contained in the photograph is known.—*Science.*

A Wonderful Microscope.—A monstrous microscope is being built at Munich, by the Poeller Physical-Optical Institute, for exhibition at Chicago, in 1893. It is intended for projecting images upon a screen, and electricity is used, not only for producing the necessary light, but for regulating the focus, centering the specimen to be examined and cooling the apparatus. The last object, which is a very desirable one, as the heating of the instrument by the artificial light, which, in this case, is an arc of 11,000 candle power, sets up disturbing currents of air, deranges the focus by expansion, and affects the objects unfavorably, is attained in an ingenious manner. A small copper cylinder, filled with liquid carbonic acid, under a pressure of about 350 pounds to the square inch, is connected with the microscope in such a way that the opening of a

valve throws a drop of the acid, in fine spray, over the portions of the instrument most exposed to the heat. The liquid immediately evaporates, producing intense cold, and reducing the temperature of the metal with which it is in contact, to the desired point. The opening of the valve is automatically effected by an electric regulator, and the consumption of the liquefied gas is very slow. The magnifying power of the instrument is enormous. Under ordinary conditions it is arranged for magnifying 11,000 diameters, but, by immersing the lenses in vaseline oil, more powerful objectives can be used, which will magnify 16,000 diameters. Some idea of the effect may be had by reflecting that, with the more powerful objective, one of the almost invisible worms, known to children as "vinegar eels," would appear on the screen as a serpent more than a hundred feet long, while the finest flour would be shown as a heap of enormous boulders. The cost of building this gigantic instrument is said to be only about $9000. If it could be bought for anything like that sum it would be well worth securing for this country.

All He Wanted to Know.—"Did you say your brother had a detective camera?" said Herbert to Ethel.

"Yes."

"Of course everybody knows that photographs can be made by electric light."

"Certainly."

"And your father is putting incandescent burners into the house?"

"He is."

"That is all I wanted to know," and Herbert left never to return. —*Detroit Free Press.*

He Has a Camera.—A certain youth in West Chester owns a Kodak, and since the return of the Normal School students he has been engaged in active service in the vicinity of the school, of course taking his camera with him. He has secured the photographs of several of the girl students, and they are righteously indignant over his audacity in sending them messages to the effect that he had their pictures and would give them a choice of the same if they wished them. —*Local News.*

Boston Enterprise in Other Cities.—Mr. G. Waldon Smith, the Boston photographer, recently opened two new studios at Portland and Old Orchard beach. The latter is for the summer only and has been remodeled and refurnished in very dainty style. The Portland

studio is a very valuable acquisition and promises to be the leading establishment of its kind in Maine, occupying as it does an entire building in the most central business portion of that city. The same degree of favor and success for which this popular artist's Boston studio is famed has already been accorded these two new ventures.

Mr. Smith, it is understood, will also build two other galleries in growing cities this fall. From this it will be noted that this rising young artist is "doing quite well." Mr. Smith, who came to Boston less than seven years ago, has, by energetic and hard work, risen to the top of his profession; being in every sense of the word, a self-made man, depending upon his own hard work and constant attention to the smallest details of his business.

Artificial Ivory.—Attempts have been made to produce a good artificial substitute for ivory. Hitherto none have been successful. A patent has recently been taken out for a process based upon the employment of those materials of which natural ivory is composed, consisting, as it does, of tribasic phosphate of lime, calcium carbonate, magnesia, alumina, gelatine and albumen. By this process quicklime is first treated with sufficient water to convert it into the hydrate, but before it has become completely hydrated, or "slaked," an aqueous solution of phosphoric acid is poured on to it; and while stirring the mixture the calcium carbonate, magnesia and alumina are incorporated in small quantities at a time; and lastly, the gelatine and albumen dissolved in water are added. The point to aim at is to obtain a compost sufficiently plastic and as intimately mixed as possible. It is then set aside to allow the phosphoric acid to complete its action upon the chalk. The following day the mixture, while still plastic, is pressed into the desired form in moulds and dried in a current of air at a temperature of about 150 degrees C. To complete the preparation of the artificial product by this process, it is kept for three or four weeks, during which time it becomes perfectly hard.—*Scientific American.*

WHATEVER be the state of colored photography, a process for photographing in colors has been patented in London, and the company is about to begin business.

In the Twilight Hour.

WHO ever serves his country well has no need of ancestors. *Voltaire.*

LIFE, according to an Arab proverb, consists of two parts—the past, a dream —the future, a hope.

NECESSITY is the only real sovereign in the world, the only despot for whom there is no law. *Bulwer Lytton.*

ATTENTION is the stuff that memory is made of; and memory is accumulated genius. *Lowell.*

UNDERSTANDING truth like all successful living processes implies life. A dead mind, a remote mind, a feeble mind, cannot be taught vigorously.

John Bascom.

WHAT brevity characterizes Scripture prayers! They are direct without familiarity or cant. Many of them are voiced in a single breath.

Lewis O. Thompson.

NOW that vacation is over it will take a good many people the rest of the year to recover from it physically, financially, and morally. *Christian Culture.*

DEEP convictions setting in the right direction hold the soul steady in its course against the comparatively lighter influences and passions, which fret the surface of life. *W. C. Gray.*

WHEN those of generous disposition fall, though habits of dissipation, we should remember that the demon of temptation walks hand in hand with the most lovable traits of human nature.

M. F. Wilson.

UNDER the laws of Providence is a life of approbation; probation is a series of temptations; temptations are emergencies; and for emergencies we need the preparation and safe-guard of prayer.

Austin Phelps.

GOOD sense, which only is the gift of heaven,
And though no science, fairly worth the seven. *Pope.*

WE are far more likely to catch the vices than the virtues of our associates.

Diderot.

LET every dawn of the morning be to you as the beginning of life, and every setting sun be to you as its close;—then let every one of these short lives leave its sure record of some kindly thing done for others—some goodly strength or knowledge gained for yourselves.

Ruskin.

LOUDLY to praise courage, independence and virtue in general in others, by no means compensates us for the lack of that same virtue in ourselves. To praise a virtue is quite a different thing from possessing it. And if we think that we can pass off the former for the latter we deceive ourselves. The world knows better. "He that doeth righteousness is righteous." He that only talketh it is a hypocrite.

Rev. J. M. Hart, D. D.

Literary and Business.

TRAITEMENT DES RESIDUS PHOTOGRAPHIQUE. Par Maurice Peligot. Ingènieur Chimiste. Paris, Gauthier. Villars et Fils, 1891, p. p. 44.

A clear, brief treatise on the recovering of silver and gold from the residue and waste of photographic establishments.

The author states in his preface that the amount of silver used has so largely increased since the introduction of the dry plate, that there is used annually in France alone in the manufacture of bromo-gelatine plates from 10,000 to 15,000 ^{kgs} of nitrate of silver which as he goes on to state, putting the amount of silver metal at 63^{kg} to 100^{kg} of nitrate of silver, gives an annual use of 1,925,364 fr worth of silver at par.

He says that there is great inattention paid to the matter of the recovering of waste—amateurs generally never giving it any consideration whatever—and many professional photographers either doing no better, or disposing of their waste to parties who go around purchasing it for little or nothing.

Tables are given after Van Mouchhaven, Davanne & Pabst showing the actual amount of silver in the gelatine film on albumen paper—and the loss in fixing, washing, etc. The modes of recovering are those usually practiced.

LA PHOTOGRAPHIC SANS OBJECTIF AN MOYEN D' UNE PETITE OVERTURE.—Propriètès.—Usage—Applications. Par R. Colsom, Capitaine du Gèmie, Rèpètiteur de Physique à l'école Polytechnique. Deuxicine èdition revue et Augmentèe. Paris Gauthier—Villars et fils, 1891.

This little volume of seventy pages is thorough, and we may say exhaustive of the subject of making photographs through a very small round opening solely without the use of a lens.

The author demonstrates theoretically by nice calculations all the practical requirements for photographing without a lens and he seems to have further made good the problems set forth by actual work, in viewing generally, making of stereoscopic pictures and copying. He sets forth that owing to the extreme cheapness and simplicity of the mode it may be largely useful to travelers, typographical engineers, artists and many amateurs.

The book is intensely interesting in as much as it shows how earnestly and painstakingly the author has taken hold of a subject which has generally been looked upon as a mere curiosity.

The best that he can claim for a hole in place of a lens is a very extended field and extreme geometrical precision. He admits that in copying he makes a tint or half-tone of an engraving owing to the ines blurring together.

Accompanying the treatise is a cabinet photograph. View of the Esplanade des Invalides. Made on a gelatine plate. Distance of plate from opening O^{m}, 28. Diameter of the opening O^{mm}, S. Exposure 3 minutes. It is not remarkable either for extreme definition or the depth of focus shown. To sum up the *hole* we can only say that we still feel inclined to stick to a good lens—unless perhaps we contemplated photographing in Central Africa, in which case the extreme probability of a hole, and the ease with which it could be replaced, in case that by any mishap we lost the *whole*, would make us perfectly independent with a hole instead of a lens.

HON. JEDEDIAH HORNBLOWER (of Wayback).—Do you deal in photographs of celebrities?

DEALER.—Yes, sir.

HON. JEDEDIAH HORNBLOWER.—Wa-al, I'd like to leave a couple dozen o' mine with you. People here in New York don't seem to know me as well as they do up home.—*Puck.*

RECENT PATENTS.

ISSUE OF SEPTEMBER 1ST, 1891.

458,981—Photographic Apparatus; E. W. Perry, Jr., New York, N. Y., assignor of one-half to E. Kipper, Adams, Mass.

458,699—Photographic Apparatus; H. Thümler, Berlin, Germany.

458,907—Photographic Apparatus; Magazine Plate-holder, for E. Kipper, Adams, Mass., and E. W. Perry, Jr., New York, N. Y.

458,979—Photographic Apparatus; Plate-holder for E. W. Perry, Jr., New York, N. Y., assignor of one-half to E. Kipper, Adams, Mass.

458,663—Photographic Films; Manufacture of Flexible, H. M. Reichenbach and S. C. Passavant, Rochester, N. Y.

458,980—Photographic Plates or Films; exposing and shifting, E. W. Perry Jr., New York, N. Y., assignor of one-half to E. Kipper, Adams, Mass.

458,711—Picture-holder; T. Green, Newark, N. J.

ISSUE OF SEPTEMBER 8TH, 1891.

No photographic patents were included in this issue.

ISSUE OF SEPTEMBER 15TH, 1891.

459,411—Photographic Apparatus; automatic registering, E. E. Moore, Syracuse, New York.

459,513—Picture-frame Fastener; J. A. Montz, Wilkesbarre, Pa.

ISSUE OF SEPTEMBER 22ND, 1891.

460,099—Camera; F. A. Hetherington, Indianapolis, Ind.

459,938—Photographic Vignetting Attachment; G. H. Richards, assignor by mesne assignments to A. J. Lamborn, Philadelphia, Pa.